

Optional Safety Modules for IMD & IMDL servo drives

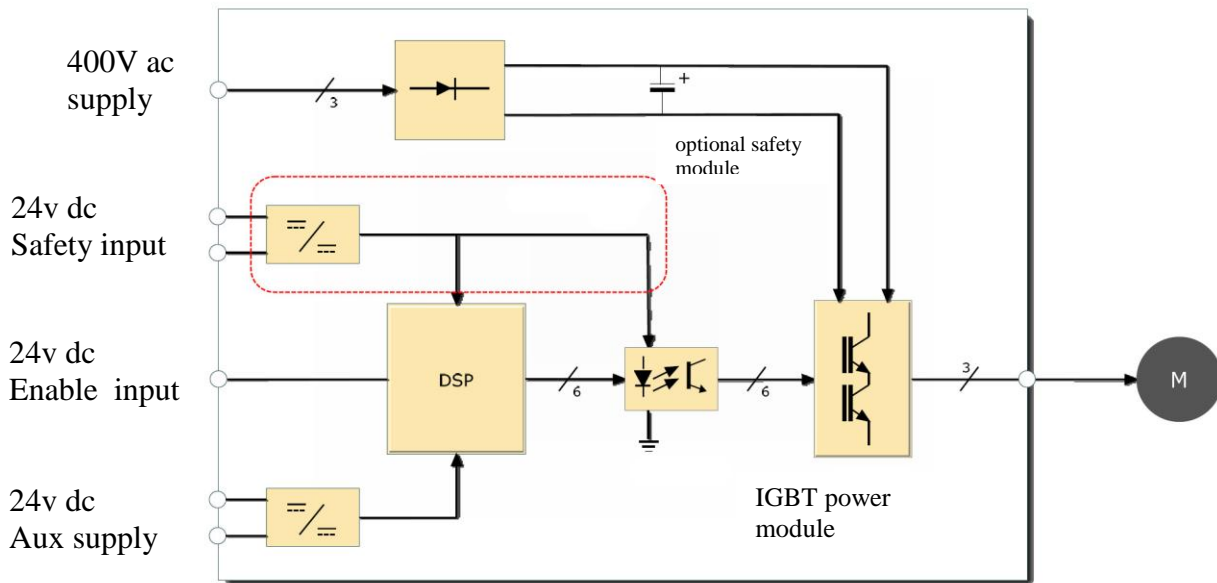
INSTALLATION INSTRUCTIONS

Serad reserves the right to modify all or part of the specification of the equipment without prior warning.

Whereas all measures have been taken to ensure the accuracy of the information provided, Serad assumes no responsibility for any errors that may appear in this document.

The optional SAFETY modules meet the requirements of many Automation and Motion Control applications where the servo drive needs to be put into a safe state with no possibility of any motor torque being developed. The SAFETY function guarantees that when there is no supply to the Safety Input there will be no torque produced by the motor.

This function is ideal for machines where operator interventions are frequent (opening covers, loading and unloading parts etc).

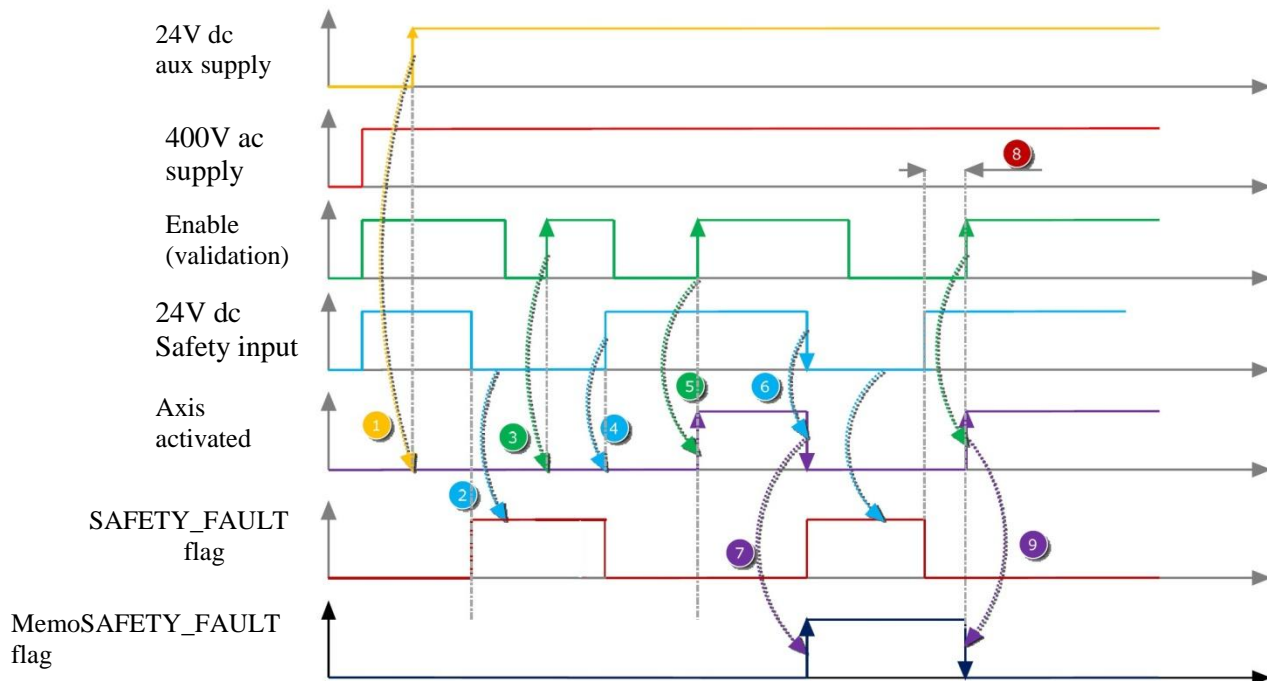


The SAFETY function removes the motor torque and prevents its restart by removing power to the IGBT control circuits. The external 24V dc connected to the SAFETY input terminals is used to supply a DC/DC converter which in turn is used to supply the IGBT control circuits.

It ensures zero motor torque while maintaining the 400V ac supply to the drive's power circuits.

Furthermore, the SAFETY function signals to the DSP when there has been a supply loss at the Safety Input and deactivates the control loops, even if the voltage on the Safety Input disappears for a short time.

Functionnement



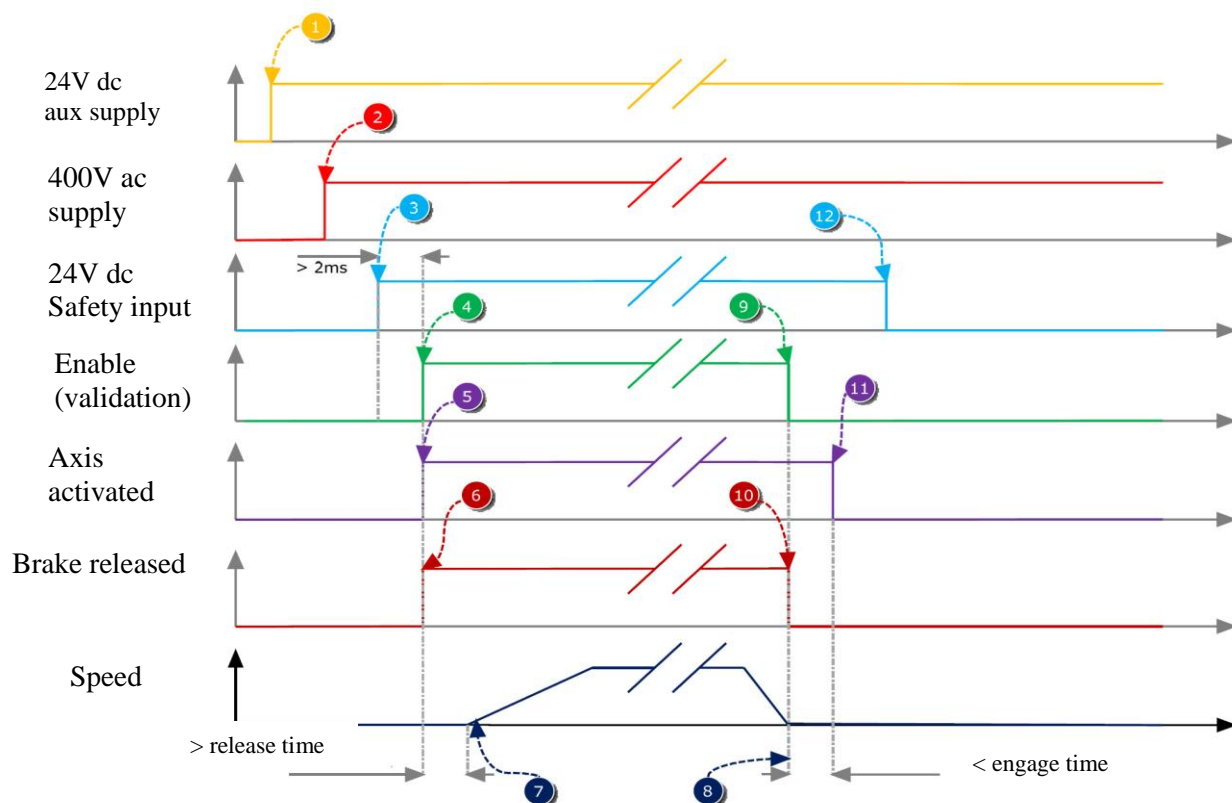
- If the 400V ac supply is already present when the 24V auxiliary voltage is applied and the Enable input and Safety Input are present, the axis is not activated.
- The flag SAFETY_FAULT, in the object Flags, indicates that no voltage is present on the SafetyInput. The flag MemoSAFETY_FAULT, in the object Flags2, is not affected.
- The Enable input has no effect when there is no voltage on the Safety Input. The drive remains disabled.
- If the Enable input is already present when a voltage is applied to the Safety Input the drive will remain disabled.
- A rising edge on the Enable input with the voltage already present on the Safety Input is required to activate the drive.
- The loss of voltage on the Safety input deactivates the drive.
- The deactivation of the drive as a result of a loss of voltage on the Safety input is latched by the flag MemoSAFETY_FAULT in the object Flags2.
- It is necessary to have at least 2ms filtering on the Enable input to guarantee activation of the drive by the simultaneous application of the Enable and Safety inputs.
- Each time the drive is activated the flag MemoSAFETY_FAULT in the object Flags2 is reset to 0.

The flag « SAFETY_FAULT » is available on bit 7 of the object Flags (6510h/06h) in the CANopen dictionary of the drive.

The flag « MemoSAFETY_FAULT » is available on bit 2 of the object Flags2 (6510h/68h) in the CANopen dictionary of the drive.

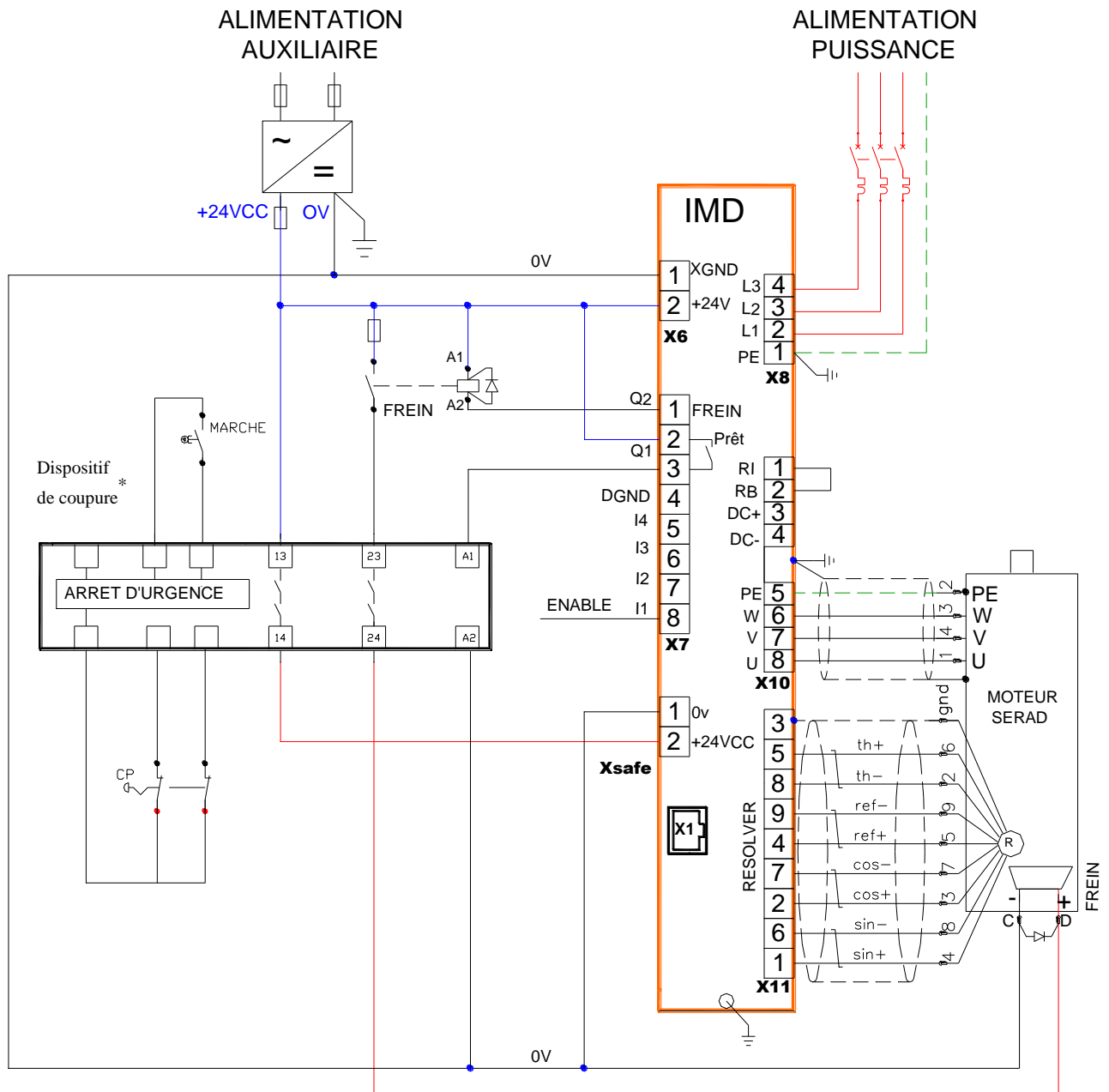
The instruction ReadParam can be used to read these flags in an iDPL program.

SAFETY Normal Cycle



- The 24V dc auxiliary supply is applied.
- The 400V ac supply is applied. The drive cannot be enabled until the dc bus capacitors have charged via the soft start circuit.
- The supply to the Safety input is applied. The drive is still not activated.
- The drive is enabled (either by the Enable input or by software).
- The drive is now activated, the IGBTs are being controlled and the drive is delivering power to the motor.
- For an axis with a brake, the brake must be released immediately. A parameter in the drive indicates the time required for the brake to release.
- After the brake is released it is possible to command a movement of the motor.
- When the operator needs to access a dangerous zone he commands the movement to stop.
- The axis stops and the drive validation is removed.
- For an axis equipped with a brake the brake is applied as soon as the axis validation is removed.
- After the programmable delay of the brake operation the drive is disabled.
- On entering the danger zone the supply to the Safety input must be removed to ensure that no torque can be generated by the motor. For an axis without a brake the motor shaft is free to rotate.

Adjustling example



* Dispositif de coupure : to be defined according to the machine and the security norms EN 62061, EN ISO 13849

